I—STUDIES IN OMUS AND CICINDELA.

Having recently received a considerable series of *Omus* and many interesting new forms of *Cicindela*, it seems desirable to draw up a short paper on the subject and the opportunity is taken to give a renewed systematic study of the genus *Omus*, which may aid in forming a more exact and comprehensive idea of the relative degrees of relationship of its many rather confusing species and subspecies.

Omus Esch.

This genus, as known at present, may be divided into three passably well defined subgenera as follows:

Elytra oval; lateral margins of the pronotum acute and without setæ..2
Elytra subcylindric, the lateral thoracic margins not so acute and having erect setæ.....3

2—Elytra with numerous very large foveæ, which are disposed without order among the smaller punctures common to all the species of the genus; median line of the pronotum dilated and foveiform at the middle. [Type and only known species *Omus dejeani* Reiche]. **Megomus**

Elytra with very small and sparse foveæ mingled with the punctures; median stria of the pronotum never so dilated centrally; coloration deep black to slightly brownish, apparently never metallic. [Type *Omus californicus* Esch.] .....**Omus**

3—Elytra punctured and with small sparse foveæ nearly as in *Omus;* colors generally submetallic. [Type and only known species *Omus submetallicus* G. H. Horn].....**Leptomus**

It is not necessary to refer more particularly to *dejeani* and *submetallicus* just now and the present study will be limited to the subgenus *Omus* as defined above.

Subgenus **Omus** Esch.

Observing critically the very numerous taxonomic forms of this subgenus, it becomes easy to recognize seven well defined groups as follows:

Antennæ distinctly shorter in the female than in the male; prothorax relatively narrow, feebly sculptured, deeply declivous at the sides; elytra having a tendency to be broadest behind the middle. Northern coast regions.....Group I

Antennæ about equal in length in the two sexes, except in *fraterculus*..2
2—Pronotum very deeply and conspicuously vermiculately rugose. Coast regions.....Group II
Pronotum feebly and more finely vermiculately rugulose throughout the surface.....3
Pronotum smooth, at least centrally.....6
3—Prothorax somewhat as in *dejeani* in outline, widest near the apex, the sides nearly straight and strongly posteriorly oblique. Sierras. Group III
Prothorax with the sides less oblique and always more or less rounded..4
4—Prothorax relatively small; body very elongate; legs notably long. Sierras.....Group IV
Prothorax as usual, relatively well developed; legs not conspicuously long.....5
5—Body narrower, always notably elongate in form. Coast regions. Group V
Body stouter, generally duller in lustre. Sierras.....Group VI
6—Body stout, more ventricose, generally dull in lustre. Sierras. Group VII

These groups are rather sharply delimited in structure and general habitus; they will be designated below by the principal species in each case.

Group I (*audouini*).

The species are moderately numerous and are confined to the more northern regions, perhaps more especially near the coast, but of this I am not sure in all cases.

Body ventricose, the hind body always very much wider than the prothorax.....2
Body very slender, the elytra more subcylindric and but little wider than the prothorax.....7
2—Elytral punctures strong, irregularly subconfluent, generally without intermingled minute punctures.....3
Elytral punctures feebler, more uniform in distribution and with interspersed minute punctures.....6
3—Elytral punctures toward the suture feebler and finely lineiform at the bottom; body massive, the prothorax larger, rather wider than long, the base rather strongly bisinuate; surface between the more rugulose apical and basal regions almost smooth, opaculate, with very fine anastomosing lines and very minute punctulation; elytra widest slightly behind the middle; antennæ rather stouter basally than in the other species of the group. Length (♂) 16.0 mm.; width 6.0 mm. California (Shasta Co.),—Nunenmacher. **ambiguus** Shpp.
Elytral punctures more rounded, deeper, not lineiform at the bottom at any part of the surface.....4

4—Hind tarsi (♀) shorter, about as long as the tibiæ; prothorax narrow, as long as wide even in the female, the base more transverse and more broadly and feebly bisinuate; surface with the anastomosing lines rather distinct, the minute punctulation evident. Length (♂♀) 14.0–15.5 mm.; width 5.0–5.5 mm. Oregon and Washington State. Rather abundant..... **audouini** Rche.

Hind tarsi (♀) much longer than the tibiæ.....5

5—Body small and notably slender, of a facies and in sculpture nearly as in *audouini* but with shorter and more slender antennæ; prothorax nearly similar, narrow, as long as wide and nearly similar in the two sexes as in *audouini*. Length (♂♀) 12.8–13.2 mm.; width 4.4–4.8 mm. Oregon..... **parvulus** Csy.

Body large, very stout and massive; antennæ notably short in the female; prothorax much larger and broader than in the two preceding, wider than long, the base transverse and barely perceptibly bisinuate, the surface opaculate and with fine anastomosing lines and minute punctulation as in *audouini*; elytra broad, rather feebly convex medially, widest at the middle and with the punctures more evenly circular and much deeper than in any other of the group, perforate, the interspaces rather shining, only feebly alutaceous and without trace of minute punctulation. Length (♀) 17.0 mm.; width 6.3 mm. Northern California (without record of more definite locality).
rugipennis n. sp.

6—Body rather shorter, relatively broader and moderately convex, the hind tarsi much longer than the tibiæ in both sexes; prothorax relatively larger and broader than in *audouini* or *parvulus*, though nearly similarly sculptured; base transverse and very feebly bisinuate; elytra widest at the middle, the punctures rather small and well separated internally and also rather more than usually obsolete near the humeri, which are distinctly convexo-declivous as usual; interspersed minute punctulation very obvious. Length (♂♀) 13.8–15.8 mm.; width 5.3–5.9 mm. California (Del Norte Co.),—Nunenmacher ..... **humeroplanatus** W. Horn

Body larger, more elongate and more convex, relatively not so ventricose as in *audouini*, the prothorax much larger, very little wider than long, opaculate, the fine anastomosing lines evident; base transverse, broadly and very feebly bisinuate; elytra one-half longer than wide, barely one-half wider than the prothorax, widest a little behind the middle; surface very convex, with the micro-granulation strong and more conspicuous than in any other species, almost obliterating the minute punctulation, the punctures rather coarse and confused but unusually shallow and generally with their bottom finely lineiform by transverse light, the scattered foveæ very inconspicuous, much less evident than in the preceding; hind tarsi but little longer than the tibiæ. Length (♂) 16.0 mm.; width 5.9 mm. California (Shasta Retreat, Siskiyou Co.)..... **solidulus** n. sp.

7—Form and habitus radically different from any of the preceding, due to the very elongate cylindric outline; front nearly smooth and without punctures between the foveæ; prothorax about as long as wide, sculptured nearly as in *audouini*, the transverse subbasal groove

rather deep, the sides at its ends feebly constricted; base transverse, very feebly bisinuate; elytra four-fifths longer than wide, scarcely more than a fourth wider than the prothorax, the sides parallel, barely arcuate except basally and apically, finely, sparsely punctate and with rather distinct foveæ. Length (♂) 13.7 mm.; width 4.25 mm. California (Lassen Co.),—Nunenmacher.

cylindricus W. Horn

I am unable to persuade myself that any one of the above forms has less than specific value and would not know how to make the combinations; they are undoubtedly distinct among themselves and by no means so closely allied as in some other groups, where many of the forms obviously have rather less than full specific weight. At first it seemed as though *parvulus* might be no better than a subspecies of *audouini*, but the recent discovery of the female, with its short delicate antennæ and long hind tarsi, apparently determines its specific value.

Alluding to the general question of species in the genus *Omus*, it is quite beyond my power of comprehension to understand how any student, having within him a moderate development of the sense of proportion and having before him such forms as *cylindricus*,* *lævis*, *cribripennis*, *parvicollis* and *edwardsi*, for instance, could, with all their manifold peculiarities of structure and facies, hold them to be of no greater taxonomic weight than mere subordinates of a single species. Such an opinion, I am thoroughly convinced, could only arise from a misconception of the term species from a pragmatic viewpoint.

Group II (*californicus*).

The various units in this group hold much more truly to the typical form than in the preceding and, though recognizable on actual comparison, some of them may be rather difficult to decipher from descriptions, however full of detail. They fall under three rather distinct stem forms as follows:

* The original name given this species was *angusto-cylindricus*. The infliction of such unwieldy names as this and *intermedio-pronotalis* upon our nomenclature may betray a lack of sympathetic respect for our powers of endurance in quoting them, or else, perhaps, they may not be intended to be permanent in their entirety as specific names. I have assumed the latter to be the correct, because the more rational, assumption, and have therefore omitted the unnecessary qualifying part of these hyphenated specific names.

Body rather stout, strongly convex, the sides of the prothorax converging and but slightly arcuate from near the apex to the base.....2

Body much narrower, the elytral punctures denser; prothorax with the sides subparallel and broadly arcuate in more than apical half, then rapidly more convergent to the base; copulatory spicule in *mimus* nearly as in *californicus*, concealed in the type of *sculptilis*.....3

2—Form only moderately elongate, ventricose, shining; head narrower than the prothorax in both sexes, rugose throughout, the median part of the front without punctures; prothorax obtrapezoidal, about as long as wide, a little wider in some females, very deeply vermiculato-rugose throughout; elytra oval, barely more than one-half longer than wide, widest at the middle, the coarse strong punctures well separated suturally, close and subconfluent laterally; copulatory spicule obliquely and almost rectilinearly truncate externally at tip, the latter only moderately prolonged. Length (♂♀) 14.0–16.8 mm.; width 5.0–5.9 mm. California (about San Francisco Bay). Abundant.....**californicus** Esch.

A—Similar to *californicus* but rather larger and more elongate, the elytra three-fourths or more longer than wide; prothorax always wider than long by a fourth to third of its length in the female, in which sex it is more than three-fourths as wide as the elytra; copulatory spicule not exposed in the single male. Length (♂♀) 15.5–17.5 mm.; width 5.4–6.0 mm. California (locality not recorded but probably near San Francisco). Three examples.

vermiculatus n. subsp.

Form still more abbreviated, ventricose, much smaller in size, rather shining; head barely narrower than the prothorax, rugose throughout; prothorax as in *californicus* but with the vermiculiform rugosity coarser and rather less deep, becoming in fact rather feeble very near the median stria; elytra very evenly oval and widest at the middle, with strongly arcuate sides, the punctures coarse, deep and rather close-set, more evenly spaced throughout than in *californicus;* copulatory spicule very different, narrower and more prolonged apically and evenly arcuate in curvature, not at all truncate externally. Length (♂) 13.0 mm.; width 5.0 mm. Oregon (Josephine Co.),—Nunenmacher. .....**oregonensis** Csy.

3—Body rather narrow and elongate, moderately convex, moderately shining, more densely sculptured than *californicus;* head narrower than the prothorax, very closely and strongly rugose throughout; prothorax wider than long, the vermiform rugæ very deep and finer than usual in *californicus;* elytra oblong-oval, two-thirds longer than wide, the sides only moderately arcuate, widest near the middle, coarsely, deeply and very uniformly, closely and almost subconfluently punctured throughout, each puncture having a more distinct granule at its anterior end than in *californicus* and rather less coarse and more elongate in form. Length (♂) 15.5 mm.; width 5.4 mm. California (north of San Francisco). A single example.

sculptilis Csy.

A—Smaller and still narrower than *sculptilis* but otherwise very similar, except that the head is about as wide as the prothorax, the rugæ

of the latter not so fine and the elytra more evenly elongate-oval and less oblong; they are also more convex and have the punctures more clearly separated and without such evident acute granules, being more as in *californicus*. Length (♂) 14.0–14.3 mm.; width 4.8–5.1 mm. California (the type bears no more accurate indication of locality, but another example at hand was collected near San Francisco) ..... **mimus** Csy.

Additional material serves to show that *sculptilis* should be given higher relative value than previously accorded it, the narrow form of body and peculiar outline of the prothorax, still more accentuated in *mimus*, serving to isolate it from *californicus* at a glance; *mimus* is evidently closely related but is much more slender in its anterior parts. The types of *vermiculatus* were received under the name *lecontei*.

Group III (*edwardsi*).

The large stout forms, with very oblique and nearly straight sides of the prothorax, constituting this group, are well known to all collectors. They are apparently very circumscribed in habitat, being confined to that part of the Sierras in and near Placer Co. The elytra are frequently slightly brownish in tint, apparently not always wholly because of immaturity. Having been fortunate enough to personally capture a single example of the true *edwardsi* on the shore of Lake Tahoe, I feel better prepared to separate the various units in a more definite manner, for in most collections a number of distinct modifications of the stem form figure under the name *edwardsi*, which in its typical development inhabits only the region near Lake Tahoe. There are two distinct types in the group as follows:

Elytral sculpture coarser and denser, the punctures rather close-set suturally, becoming densely crowded on the flanks 2

Elytral sculpture much finer, the punctures everywhere notably small, widely separated suturally and never densely crowded on the flanks.. 3

2—Form oblong-elongate, only moderately shining, black; head finely and rather feebly rugulose, the front between the impressions nearly smooth but without punctures; prothorax relatively smaller than usual and less transverse, somewhat as in *edwardsi*, only a third to two-fifths wider than long, finely and closely vermiculato-rugulose throughout; elytra two-thirds to three-fourths longer than wide, more oblong than usual, the sides less arcuate, widest at the middle and less than one-half wider than the prothorax. Length (♂♀) 17.5–18.0 mm.; width 6.0–6.6 mm. California (Placer Co.).

montanus Csy.

A—Form nearly as in *montanus* but rather more slender and frequently brownish in color, the sculpture similar throughout; prothorax shorter and more transverse, relatively more narrowed at base; hind tarsi shorter and more slender. Length (♀) 16.8–17.8 mm.; width 5.8–6.0 mm. California (Placer Co.). One specimen received at the same time as the preceding and another from a different source. . . . . **brunnescens** Csy.

3—Form stouter, the hind body shorter, more dilated and with more arcuate sides than in *montanus*, very faintly brunnescent; head similar but with still feebler rugulosity; prothorax only a fourth wider than long, finely rugulose and with some extremely minute punctulation, the anterior transverse impression conspicuous; elytra scarcely more than one-half longer than wide, very evenly oval, with evenly arcuate sides, widest at the middle; punctures fine and well separated even on the flanks. Length (♂) 17.0 mm.; width 6.2 mm. California (Lake Tahoe). . . . . **edwardsi** Cr.

A—Larger than *edwardsi* but otherwise very similar, except that the prothorax is slightly more transverse and the fine rugulosity of the pronotum distinctly stronger, with more shining interspaces; labrum with the median lobe strong, more abruptly truncate at the tip of the lobe than in *edwardsi;* elytra more elongate though evenly oval, with arcuate sides, the punctures rather small and well separated but stronger than in *edwardsi*, the scattered foveæ much more distinct than in that species, where they are unusually feeble and indistinct. Length (♂♀) 15.8–18.5 mm.; width 5.5–6 7 mm. California (Placer Co.). [*O. lucidicollis* Csy.].
lobatus Csy.

In the above described topotype of *edwardsi*, the seta at each side of the epistoma is at the middle of the length and there are four long stiff setæ above each eye, a condition which is however unstable in the genus. *Lucidicollis* cannot be maintained even as a well defined variety and must be united with *lobatus*.

Group IV (*parvicollis*).

The general habitus in this group, due to the very elongate form, small prothorax and fine sparse elytral punctures, is altogether different from that of any other type of the genus; the various units seem to be confined to the southern Sierras, in and near Tulare Co. Those known thus far are the following:

Body very slender, elongate, convex, deep black and subopaculate; head subequal in width to the prothorax, moderately though distinctly rugose, the median part of the front smooth and not punctate; apical part of the mandibles very long and slender; prothorax as long as wide (♂) to slightly wider than long (♀), barely more than half as wide as the elytra, the sides converging from near the apex

to the base and feebly arcuate; base feebly lobed medially; surface opaque, with very fine anastomosing irregular lines and fine anterior transverse impression, between which and the apex the surface is longitudinally rugulose; elytra evenly oval and widest at the middle, nearly twice as long as wide, finely sparsely and evenly punctate, the punctures well separated and not larger on the flanks, the scattered foveæ small and generally rather feeble. Length (♂ ♀) 16.5–19.0 mm.; width 5.4–6.7 mm. California (at various points in Tulare Co.). Rather abundant..... **parvicollis** Csy.

A—Similar to the preceding but larger, with the head (♂) distinctly narrower than the prothorax, the mandibles rather less prolonged apically, the anterior impressions feebler, the front feebly rugulose and the antennæ longer; prothorax relatively not quite so small and wider than long, the sides anteriorly more inflated, similarly sculptured and similar at base but much more than half as wide as the elytra, the latter nearly similar but with the sparse punctures a little larger and the scattered foveæ more distinct, not so evenly oval and widest slightly behind the middle. Length (♂) 19.0 mm.; width 6.7 mm. California (Tulare Co.)..... **spissipes** Csy.

B—Similar to *parvicollis* but larger and still more elongate, the head not quite as wide as the prothorax, the front similarly nearly smooth and with moderate impressions; prothorax relatively larger and wider than long, more inflated anteriorly, the base not so lobed in the middle, very feebly and transversely bisinuate, the sculpture of the same nature but stronger; elytra still more elongate, evenly oval, widest at the middle and with the punctures well separated but much larger and stronger than in either of the preceding, the surface less even and the foveæ distinct. Length (♂ ♀) 18.5–20.0 mm.; width 6.0–7.0 mm. California (Tulare Co.). **procerus** Csy.

The copulatory spicule throughout is of the same type, long, slender and strongly bent downward apically. *Procerus* is I think more nearly a distinct species than a subspecies.

Group V (*lecontei*).

In this group the body is decidedly elongate, rather strongly sculptured and usually with shining integuments; it occurs in the coast regions from Monterey to northern Oregon, so far as now represented in my collection, and consists of four species and several subspecies as follows:

Elytra widest before the middle, gradually arcuately narrowed thence to the acute apex; labrum subtruncate; body slender; lateral margin of the prothorax fine and but slightly reflexed, attaining the base; head and pronotum rugulose throughout. Length 15–16 mm. California (southern coast ranges from Monterey to Sta. Barbara and Fort Tejon)..... **lecontei** G. H. Horn

Elytra evenly elongate-oval, widest at the middle; labrum arcuately produced and frequently narrowly truncate at apex; habitat less southern. 2

2—Sides of the prothorax strongly rounded, becoming subparallel in nearly apical half. Body slender (♂), less slender (♀), rather convex, shining; head narrower than the prothorax, coarsely wrinkled, the front medially smoother, not punctate; prothorax coarsely but not very strongly, vermicularly rugulose, the base transverse, not evidently bisinuate; anterior transverse impression fine but distinct; side margins sharply reflexed, strongly near the base, which they virtually attain; elytra fully three-fourths longer than wide, with evenly arcuate sides and small, widely separated punctures, becoming closer but scarcely at all larger on the flanks. Length (♂ ♀) 17.0 mm.; width 5.8–6.0 mm. California (near San Francisco),—Dunn. **elongatus** Csy.

Sides of the prothorax oblique and feebly arcuate from near the apex to the base. 3

3—Front generally not at all punctulate though smooth or but feebly rugulose; southern coast regions. Body elongate, strongly convex, shining; head distinctly narrower than the prothorax, the front feebly rugulose and with traces of very minute sparse punctulation; prothorax slightly wider than long, widest near apical fourth, where the sides are inflated and rounded; side margins as in the preceding, the surface more strongly vermiculato-rugose, as in *californicus* though much more feebly; elytra two-thirds longer than wide, unusually convex, the punctures small, everywhere widely separated. Length (♂) 16.0 mm.; width 5.5 mm. California (near San Francisco),—Dunn. . . . . **dunni** Csy.

A—Narrower and still more elongate, the median part of the front very smooth and sculptureless; labrum with the median lobe much produced, abruptly truncate at tip; rugulosity strong; prothorax with the sides converging and evenly, moderately arcuate from apex to base, the margin still more strongly reflexed, especially apically and basally; surface similar; base broadly arcuate medially; elytra narrower and longer, the punctures stronger, closer laterally, each similarly with a small acute anterior granule, the foveæ small and not conspicuous. Length (♂ ♀) 16.5–18.0 mm.; width 5.5–6.2 mm. California (Carmel, Monterey Co.). . . . . **regularis** Csy.

B—Smaller and still narrower, notably slender and not so convex, less shining; head similar, the truncate lobe of the labrum not quite so prominent; prothorax throughout nearly as in *regularis*, barely at all wider than long; elytra almost twice as long as wide, very evenly oblong-oval, the punctures similarly small, well separated, aciculate and strongly granuliferous, the interspaces dull and more strongly micro-reticulate than in either of the preceding. Length (♂) 15.5 mm.; width 5.2 mm. California (Monterey Co.), —Fuchs. . . . . **maritimus** Csy.

Front generally finely, sparsely punctulate, the punctures gradually obsolescent in some forms, northern coast regions. Body moderately

elongate, convex, more shining than in the preceding section; head distinctly narrower than the prothorax, rugulose, the oblique impressions deep, the intermediate surface broadly smooth and with fine scattered punctures; prothorax well developed, slightly wider than long, the sides converging and very evenly, moderately arcuate from apex to base, the latter broadly lobed medially; side margins acute but much more finely and feebly reflexed than in the preceding section; surface with anastomosing fine sculpture, stronger laterally, feeble on the broadly flattened median part, which is more rapidly declivous at the sides to the transverse impression; elytra barely more than one-half longer than wide, the sides evenly arcuate, rather rapidly pointed at apex; surface somewhat uneven, with strong, rather close-set punctures and distinct foveæ. Length (♀) 15.5 mm.; width 5.4 mm. Oregon..... **borealis** Csy.

A—Similar but somewhat larger and a little more elongate, the punctures of the very smooth polished medio-frontal surface fine and barely evident; prothorax perfectly similar throughout, except that the rugulosity is slightly finer and feebler and the median flattened part is better defined posteriorly by the rather more abrupt slopes; median stria sometimes slightly deeper centrally—a reversion toward *Megomus*; elytra similar and widest at the middle, with evenly rounded sides but more elongate and not quite so convex, two-thirds longer than wide; punctures small and widely separated medially, stronger and closer laterally. Length (♂) 17.0 mm.; width 6.0 mm. California (Plumas Co.), —Nunenmacher..... **pronotalis** W. Horn

B—Similar to *pronotalis* but a little narrower, more convex and still more shining, the front similar, the punctulation almost completely obsolete though traceable; prothorax throughout as in *borealis* but rather strongly and more evenly, vermicularly rugulose throughout, the postero-median flattened part less well defined than in *pronotalis* but better defined than in *borealis;* base transverse, barely at all lobed medially; elytra nearly three-fourths longer than wide, very evenly oval, with evenly arcuate sides, the surface convex, the punctures fine and sparse suturally, a little less fine and less sparse laterally, the foveæ small but distinct. Length (♂) 16.5 mm.; width 5.5 mm. California (Lassen Co.), —Nunenmacher..... **nunenmacheri** W. Horn

The copulatory spicule, so far as exposed in examples of this group at hand, is very slender and strongly bent arcuately downward at tip, very much as in the preceding group, but I have not been able to note its conformation in the singular *borealis* section, which is of more northern distribution and quite distinct in several directions besides the postero-medial flattening of the pronotal surface, which is barely traceable in *borealis*, feeble in *nunenmacheri* and somewhat pronounced in *pronotalis*.

Group VI (*sequoiarum*).

In some of the species of this group there is a decided sexual inequality in the antennæ, similar to that so markedly developed in the *audouini* group. The various species and subspecies seem to be confined to the Sierras, from Sierra to Mariposa Co.; they are generally of rather stout build and with opaculate or feebly shining integuments, but are less ventricose than in the *lævis* group. So far as known to me they may be differentiated as follows:

Body decidedly elongate and of larger size, strongly convex. Head narrower than the prothorax, rugulose throughout, the impressions feeble, the front between them less coarsely but distinctly rugulose and without punctures; labrum moderately and arcuately lobed; prothorax about as long as wide (♂) or wider than long (♀), obtrapezoidal, widest near the apex, with the oblique sides but very feebly arcuate and coarsely and strongly reflexed, the margin attaining the base, which is transverse, very feebly bisinuate; surface finely and very moderately vermicularly rugose, equally throughout; elytra very evenly elongate-oval and strongly convex, three-fourths longer than wide, widest exactly at the middle, the punctures small, not deep, aciculate and widely separated, but little larger and still well separated on the flanks, the foveæ small and very inconspicuous. Length (♂♀) 16.5–20.0 mm.; width 5.8–7.0 mm. California (Mokelumne Hill, Calaveras Co.),—Blaisdell..... **blaisdelli** Csy.

A—Nearly similar but still larger, the head nearly similar throughout; prothorax larger, wider than long in both sexes, the sides similarly coarsely reflexed but more arcuate, the rugulosity rather coarser; elytra similar in their regularly elongate-oval form but with the punctures very coarse and deep, separated by about their own diameters and, on the flanks, not coarser, as is usual, but smaller and more close-set though not in mutual contact; hind tarsi notably long. Length (♂♀) 17.5–21.0 mm.; width 6.0–7.2 mm. California (Placerville, Eldorado Co.)..... **cribripennis** Csy.

Body apparently rather elongate. Deep black, shining; head moderate, wrinkled all over, except the middle of the front, which is smooth and sparsely punctate, the impressions feeble; labrum moderately, arcuately lobed; prothorax wrinkled throughout but not deeply, the lateral margin fine and but slightly reflexed, attaining the base; sides feebly arcuate, moderately converging to the base; elytra elliptical, widest in front of the middle, moderately convex, closely, not deeply punctate, confusedly so toward apex. Length 17 mm. California (Coulterville, Mariposa Co.)..... **intermedius** Leng

Body notably stout in form; sides of the prothorax finely but rather strongly reflexed, much more finely so than in *blaisdelli* and *cribripennis*; median part of the front nearly smooth and with scattered small but distinct punctures as in *intermedius*.....2

2—Body larger and very stout, rather dull in lustre as a rule; head much smaller than the prothorax, rugulose throughout but more obsoletely

at the middle of the front, the impressions feeble; prothorax unusually short, fully a third wider than long, widest near apical fourth, the sides only very moderately oblique and rather feebly arcuate thence posteriorly to the base (♂), or nearly to the base, where they become strongly oblique (♀), the acute margin attaining the base, which is transverse, broadly, feebly bisinuate; surface distinctly and evenly vermicularly rugulose throughout; elytra (♂) evenly and obtusely oval, widest at the middle, or (♀) more acutely and obliquely tapering apically and sometimes widest a little before the middle, the punctures rather strong and deep, well separated, coarser and dense laterally. Length (♂♀) 15.5–17.5 mm.; width 6.1–6.5 mm. California (Big Trees, Calaveras Co.). **sequoiarum** Cr.

A—Similar but a little larger and rather more elongate, the prothorax similar throughout, except that it is less abbreviated, being about a fourth wider than long; elytra (♂) not evenly and obtusely oval but widest well before the middle, thence arcuately tapering to the acute apex, the punctures similarly strong and deep and everywhere closer; labrum similarly with a pronounced narrowly truncate median lobe. Length (♂) 17.5 mm.; width 6.3 mm. California,—Levette..... **lugubris** Csy.

B—Similar to *lugubris* throughout but with still somewhat less transverse prothorax, in which the acute side margin does not attain the base as in the two preceding, but abruptly terminates at a considerable distance from the base; elytra (♂) evenly and very obtusely oval, widest at the middle, the punctures not so coarse, more nearly as in *sequoiarum* but more close-set, subcontiguous, the foveæ very few, small, widely dispersed and inconspicuous. Length (♂) 17.0 mm.; width 6.4 mm. California,—Levette. **sierricola** Csy.

C—Similar to *sequoiarum* but more parallel, less ventricose and less convex; head relatively a little larger; prothorax nearly a third wider than long, as in *sequoiarum* throughout but with the sides evenly converging and subevenly and distinctly arcuate from apex to base, very little more converging near the base, the acute margins attaining the base; elytra more oblong-oval and more elongate, slightly more than one-half longer than wide, more gradually pointed at apex though similarly widest at the middle, the punctures much finer and feebler than in any of the three preceding, substellate and sparse, but little larger or closer laterally; hind tarsi much longer, being nearly one-half longer than the tibiæ. Length (♂) 16.0 mm.; width 6.0 mm. (Big Trees, Calaveras Co.)..... **longitarsis** n. subsp.

Body much smaller, less stout and not so convex.....3

3—Male and female differing greatly, the former more slender, the latter very stout, with much larger and more transverse prothorax and decidedly shorter antennæ. Surface rather shining; head much narrower than the prothorax, the labrum rather strongly lobed; prothorax (♂) barely a fifth wider than long, the sides converging, distinctly and subevenly arcuate from apex to base, the acute margins strongly reflexed and attaining the base; surface rather

deeply but finely vermicularly rugulose throughout, or (♀) fully a third wider than long but otherwise similar, except that the rugulosity is a little coarser and stronger, almost as in some modifications of the *californicus* type; elytra oval, widest near the middle, more acutely tapering apically in the female. Length (♂♀) 13.5–15.0 mm.; width 5.2–5.9 mm. California (Forest Hill, Placer Co.).

fraterculus Csy.

Male and female nearly similar and but very moderately stout, generally less shining; elytral punctures very coarse and deep, the interspaces rather shining; head nearly as in the preceding; prothorax (♀) a fifth wider than long, differing greatly in shape from *fraterculus*, being widest at apical third, the sides thence oblique and more nearly straight to the base, the side margins and sculpture nearly similar; elytra subevenly oval, gradually acutely narrowed apically, widest at the middle, the strong punctures distinctly separated, the interspaces with scattered small punctures; at the sides the coarse punctures are very dense and everywhere somewhat aciculate. Length (♀) 14.5 mm.; width 5.25 mm. California,—Levette.

punctifrons Csy.

A—Similar, but the labrum has only four instead of six setigerous punctures in the type; prothorax (♂) nearly as in the female type of the preceding in every way and with the base similarly transverse and feebly bisinuate; elytra rather broader than in the preceding female type, less gradually acute posteriorly, the punctures still coarser and more conspicuous, in mutual contact and very coarse on the flanks; foveæ rather large but very few in number, feeble and inconspicuous. Length (♂) 14.0 mm.; width 5.28 mm. California (Sierra Co.),—Fuchs. . . . . **degener** Csy.

B—Similar in general form, the female a little stouter than the type of *degener;* head similar; prothorax a little broader, a fourth wider than long, as in *degener*, except that the sides from anterior third to the apex are straighter; elytra barely one-half longer than wide, oval, gradually acute at apex, only feebly convex, the side margins strongly reflexed basally as in *degener* and much more elevated than in *punctifrons;* sculpture differing greatly from any of the three preceding, the punctures being less coarse, still more irregular in form and densely coalescent throughout, the interspaces duller, with much stronger micro-reticulation and with scattered small punctures. Length (♀) 14.0 mm.; width 5.4 mm. California,—Levette. . . . . **confluens** Csy.

I am rather of the opinion that *cribripennis* is a species different from *blaisdelli* and that *confluens* has higher value than here suggested for it, but feel that the modern tendency to combine rather than to differentiate and to attribute structural differences in related forms to accidental causes, should be respected at least to some extent. In the females of this group the coarse setigerous punctures forming a series bordering the acute apex of the last

abdominal segment, are rather better developed than elsewhere. The copulatory spicule in the few instances where it is observable without dissection, has a form in this group very different from that seen in the preceding groups, the apex being less slender and but very feebly curved downward.

Group VII (*lævis*).

No other group comprises within its limits such marked diversity of elytral sculpture as this, for while the prothorax remains constant throughout in its very smooth opaque surface, with scarcely a trace of sculpture except the feeble rugulosity about its periphery, the elytra may be more coarsely and conspicuously punctured than in any other species of the genus as in *compositus*, or perfectly smooth, with barely a trace of any sort of punctuation as in *lævis*, this latter condition also being a unique exception in the genus. The body is rather short and notably stout in form and is unusually ventricose. The copulatory spicule is somewhat as in the *californicus* group, being subangularly bent apically, the distal part straight, but it is more prolonged than in *californicus*. There seem to be three species and several subspecies as follows:

Elytral punctures strong, each with an acute anterior granule. Body (♀) stout, convex, dull and sericeo-alutaceous in lustre; head smaller than the prothorax, moderately rugulose almost throughout, the front not punctate; impressions feeble; labrum strongly lobed; prothorax large, much wider than long, widest near the apex, the sides only moderately oblique and feebly arcuate, inwardly arcuate at base, the reflexed margin moderate, stronger posteriorly, not attaining the base; surface opaque, finely but distinctly, confusedly rugulose basally and apically and feebly, transversely plicatulate laterally; elytra less than one-half longer than wide, evenly oval, pointed apically, widest at the middle, much wider than the prothorax, the punctures rather coarse, moderately deep, impressed and in mutual contact throughout, the intervals opaculate; foveæ indistinct. Male much narrower than the female, with more oblong elytra, the punctures nearly similar but distinctly separated suturally, the interspaces similarly opaculate; prothorax as in *sequoiarum*, much narrower and more narrowed basally than in the female, the side margin attaining the base in the single example at hand. Length (♂♀) 15.5 mm.; width 5.8–6.3 mm. California (Wawona, Mariposa Co.). [*O. collaris* Csy.]. Description drawn from the type of *collaris*. . . . . **horni** Lec.

A—Male only moderately stout, convex, dull throughout; head similar but less rugulose, the front very smooth, punctureless; supra-

orbital setæ only three in number in the type; antennæ more slender; prothorax a fourth wider than long, widest anteriorly, the sides converging rather strongly and moderately arcuate thence posteriorly, abruptly straight and more oblique for a considerable distance before the base, the margin fine throughout, attaining the base; surface opaque, more feebly rugulose basally, finely, longitudinally creased apically and feebly, transversely so laterally, the stria very fine; elytra one-half longer than wide, oval, obtuse, widest at the middle, the punctures as in the preceding but smaller, more feebly impressed, almost in mutual contact, the intervals sericeous. Length (♂) 16.0 mm.; width 6.0 mm. California (Giant Forest, Tulare Co.),—Dietz..... **temperatus** n. subsp.

B—Male stout, convex, more ventricose than in any of the preceding, opaque, the elytra rather strongly shining; head moderately rugulose; supra-orbital setæ three or four in number; prothorax as in *temperatus*, the sides as strongly oblique as in *sequoiarum*, feebly arcuate, the margins abruptly rounded at the immediate base, which they attain; surface more confusedly rugulose apically than in *temperatus*, more nearly as in *horni*; elytra short, broadly oval, widest at the middle, with very coarse deep punctures, which are separated by nearly their own diameters suturally, dense laterally, the interspaces notably shining. Length (♂) 14.8–16.0 mm.; width 6.0–6.2 mm. California (Wawona, Mariposa Co.)..... **compositus** Csy.

Elytral punctures, when present, perfectly simple and without trace of an acute anterior granule..... 2

2—Elytra distinctly punctured; side margins of the prothorax attaining the base. Body stout, convex, ventricose; head very feebly rugulose, with slight impressions, the front with very fine sparse punctulation; supra-orbital setæ four in number; prothorax (♂) nearly as long as wide, opaque, with very fine or obsolescent anastomosing lines, though virtually smooth, the basal and apical rugulosity very feeble; outline as in *sequoiarum*, or (♀) larger, more transverse, with slightly less converging sides; elytra evenly oval, rather pointed at apex, widest at the middle, much broader in the female, the punctures rather coarse and dense throughout though not very deep. Length (♂♀) 15.8–18.0 mm.; width 6.0–7.0 mm. California (Tulare Co., 6400 feet). Abundant and not more than usually variable..... **tularensis** Csy.

A—Similar to *tularensis* in every way, except that the body is not quite so large and notably more slender in both sexes; head opaque, with the rugulosity almost completely obsolete, the fine frontal punctulation also indistinct; prothorax differing less sexually, the sides strongly oblique and feebly arcuate in both sexes, the surface nearly as in *tularensis* throughout but with the sculpture still more obsolete; base perfectly straight and transverse in the male type, or feebly bisinuate in a female recently received; elytra narrower and more elongate than in *tularensis* though otherwise similar. Length (♂♀) 15.0–16.8 mm.; width 5.5–6.2 mm. California (Davenport, Tulare Co., 6500 feet)..... **gracilior** Csy.

B—Similar in general characters but much narrower, more elongate, less ventricose and less convex than in *tularensis*, opaculate throughout; head smooth, with the feeblest traces of sculpture; prothorax nearly as long as wide, the sides evenly converging and very evenly, moderately arcuate from apex to base, the latter transverse and very feebly bisinuate; side margins very finely reflexed and attaining the base; surface almost perfectly smooth throughout, the anterior transverse impression feeble, the basal rugulosity fine and shallow; elytra one-half longer than wide and only a third wider than the prothorax, the punctures much smaller and feebler than in either of the preceding, becoming obsolete basally and stronger and close laterally and apically, the small scattered foveæ very distinct. Length (♂) 16.5 mm.; width 5.8 mm. California (Tulare Co.),—Dietz..... **opacellus** n. subsp.

Elytra wholly impunctate, the side margins of the prothorax very finely reflexed and not attaining the base. Body stout, ventricose, convex; head nearly smooth, the lobe of the labrum very strong, narrowly truncate at tip; prothorax (♀) a third wider than long, widest near the apex, the sides thence rather strongly oblique and feebly arcuate to the base, which is transverse and very feebly bisinuate; surface nearly smooth, rugulose postero-laterally and at base, the anterior transverse impression deep; elytra rather broad, oval, widest at the middle, arcuately and acutely ogival apically in almost posterior half; surface smooth, opaculate, with strong micro-reticulation and fine subobsolete anastomosing creases, also with feeble traces of very fine punctures apically; foveæ very small, scarcely larger than the asperate punctures bearing the setæ. Length (♀) 19.0 mm.; width 6.8 mm. California (Mineral King Road, Tulare Co., 8000 feet),—Fuchs..... **lævis** G. H. Horn

This group presents a rather more difficult taxonomic study than any other and I have puzzled long over the most probable inter-relationships of the various units. *Horni* is certainly a distinct species, but whether the forms from *tularensis* to *lævis* constitute a single species or not, I cannot quite make up my mind. *Opacellus* is a very distinct form, but there is no record at hand concerning the altitude of its habitat.

In the above arrangement I have been obliged to omit *xanti* Lec. and *vandykei* and *fuchsi* of W. Horn, not having seen any authentic representatives of them. The descriptions of *lecontei* and *intermedius* are taken from the originals and with reference also to the work of Mr. Leng. In the case of *horni*, its identity with *collaris* is merely a surmise; the available material in this restricted section is at present far too small for final judgment.

Cincindela Linn.

In the *longilabris* group, the species allied to *montana*, having the upper surface black, are better defined than those allied to *longilabris*, for they differ among themselves not only quite radically in sculpture but in tarsal characters. The strong dilatation of the first three joints of the anterior male tarsi in this group has been noted many times; this, as well as the elongate labrum, peculiar coarse sculpture and bald front in both sexes, causes it to be sharply defined among the other groups. The black species may be known by the following characters:

Elytral punctures coarse and close, everywhere either in mutual contact or densely and polygonally crowded.....2

Elytral punctures suturally smaller, rounded and clearly separated by the more shining interspaces, larger and denser laterally; under surface not or barely noticeably metallic at any part; tarsi very slender..4

2—Hind tarsi long and very slender, much longer than the tibiæ in both sexes; upper surface deep black, dull in lustre, the labrum (♂) entirely pale, or (♀) black, generally pallescent narrowly along the middle and at the basal margin; prothorax transverse, obtrapezoidal, dull, with deep transverse impressions; elytra with a fine faint and feebly bent median band and a slightly pallescent transverse apical streak; abdomen with slight metallic coloration. Length (♂♀) 13.5–15.0 mm.; width 5.0–5.7 mm. Utah (Provo),—Spalding. **montana** Lec.

Hind tarsi notably short, not longer than the tibiæ in either sex.....3

3—Tarsi throughout very slender and filiform; body smaller and more abbreviated than in *montana*; labrum (♂) pale throughout, twice as wide as long, the two apical sinuses broad and very feeble, the lateral teeth short and very obtuse, the medial small, acutely angular, or (♀) pale, nubilously black toward the margins but not basally, much less than twice as wide as long, more produced medially, the lateral teeth strong, rather bluntly angular, the medial tooth strong and very acute; prothorax very short and transverse; elytra shorter, the fine and moderately pale median band more strongly angulate than in *montana*, the apical streak obsolete; abdomen very faintly metallic. Length (♂♀) 11.5–12.8 mm.; width 4.5–5.0 mm. Alberta (Calgary),—Criddle.....**canadensis** Csy.

Tarsi very stout, much thicker than in any other species of the genus within our faunal limits; body small, short, the head and prothorax peculiarly reduced, deep black, the elytra greenish-black; labrum (♀) deep black throughout, twice as wide as long, tridentate; prothorax short and very transverse; elytra with the very fine middle band formed as in the preceding but obsolete in the type, excepting a pale point representing its posterior end, the apical streak obsolete; abdomen rather brilliantly metallic green and violet intermingled. Length (♀) 11.5mm.; width 4.5 mm. Manitoba (Aweme),—Criddle. **spissitarsis** Csy.

4—Body moderately stout, rather convex, opaque, the elytra shining, deep black, the abdomen with trace of metallic lustre; labrum (♀) deep black throughout, shining, carinate medially and with only a few coarse rugulæ, not strongly bi-impressed, tridentate on the produced tip; prothorax transverse, equal in width to the head; elytra without pale maculation of any kind; abdomen (♀) with the apex produced medially, the lobe arcuately truncate, its surface impressed; hind tarsi evidently longer than the tibiæ but much shorter than in *montana*. Length (♀) 13.0 mm.; width 4.8 mm. Nebraska. **nebraskana** Csy.

Body larger and distinctly stouter, opaque, the elytra shining, deep black; labrum (♀) deep black, produced and tridentate at tip, the surface dull, distinctly biconcave and finely, closely rugulose, strongly carinate medially; prothorax as usual, strongly transverse; elytra without pale maculation, though with the location of the median band rather obviously indicated by the form of sculpture; abdomen with feeble metallic glint, the apex (♀) wholly different from the preceding, being evenly parabolic from side to side, the middle of the apex rather narrowly rounded, with a very minute and feeble notch, the surface not impressed; in the male the apical sinus is nearly as in *montana;* hind tarsi rather short, about as long as the tibiæ in both sexes. Length (♂♀) 12.8–15.0 mm.; width 4.8–5.5 mm. Alberta (Lethbridge),—J. Harms..... **calgaryana** n. sp.

The above forms are all unequivocally specific in nature, differing among themselves in important structural features. The difference in form of the abdominal apex in the female of *nebraskana* and *calgaryana* is indeed remarkable. I regret being unable to give a complete table of this interesting group; so many of the forms allied to *longilabris* are unrepresented in my material, that it is scarcely worth while to attempt a full report. My previous statements in regard to *nebraskana* and the Lethbridge specimens are erroneous and were due to the fact that I did not at that time have the true *montana* in my collection.

In the *nigrocærulea* group it is sufficiently evident from an example of *robusta* Leng, which is now before me, that my *feminalis* does not differ except varietally, *robusta* being of a dull sericeous green and *feminalis* blackish-blue, with the same sericeous lustre; in the female of both forms the juxta-sutural shining depressed punctured spot near basal fourth is evident. In my opinion both *robusta* and *feminalis* should be considered subspecies of the apparently larger *nigrocærulea*.

The recent acquisition of the true *pusilla* of Say, enables me to make some more usefully definite statements than were possible

last year. In the first place, *cinctipennis* of LeConte, is a different species from *pusilla* and is not by any means a variety; this can be seen at first glance by reason of the relatively smaller head and less prominent eyes, as well as the paler coloration and stronger elytral sculpture of *cinctipennis*. I assume *cyanella* Lec., to be the green or blue form occurring in more northern regions and having still stronger and more asperate punctures. *Cyanella* is a subspecies of *cinctipennis*. *Terricola* Say, still remains unknown to me. The following is a subspecies of *pusilla:*

Cicindela pusilla ssp. **sayanella** nov.—Form and size, the broad head and prominent eyes as in *pusilla*, the elytra not quite so sombre in ground color, being very obscure coppery-brown, the punctures similar, sparse and fine, but becoming stronger, closer and metallic apically; the markings consist of a slender and feebly arcuate humeral lunule, a slender and entire apical lunule, inflexed at its anterior end and a short median marginal streak, which is obtusely angulate internally at its middle point; legs and tarsi (♀) a little shorter than in the female of *pusilla*; truncate lobe of the last ventral more impressed than in that species. Length (♀) 10.0 mm.; width 3.4 mm. (Monroe Cañon, Sioux Co., Nebraska.)—Knaus.

In both male and female of *pusilla*, the elytral punctures are fine and notably sparse from base to apex; the labrum is more strongly lobed and tridentate than in the female of *pusilla* and more nearly as in the same sex of *cinctipennis*. *Sayanella* is probably the form indicated by Say as a variety of *pusilla*.

The following is a distinct member of the *pusilla* group:

Cicindela tularensis n. sp.—Outline and size nearly as in *pusilla*, the ground color above obscure coppery-brown; under surface not very brilliant metallic blue-green throughout, with rather dense white hair on the sterna of the hind body and sides of the abdomen, the prosternum glabrous, its parapleura sparsely hairy; legs very slender, black, slightly metallic, the tibiæ and tarsi in great part pallescent; head rather small, but little wider than the prothorax, the latter subquadrate, only a little narrowed behind, larger in the female, finely, densely sculptured; elytra somewhat cuneiform, widest posteriorly, with nearly straight sides, having small sparse and very unevenly distributed punctures, each within a conspicuous ocellate spot, which is blue centrally and gray peripherally, the foveæ of the irregular subsutural series very small and inconspicuous. Length (♂♀) 9.5–10.3 mm.; width 3.3–4.0 mm. California (Tulare Co.). Four examples, received under the name *lunalonga* var. *tuolumnæ*.

In one male the pale markings on the elytra consist of a very slender humeral lunule, a very fine linear apical lunule, rectilinearly

deflected at right angles anteriorly and a short medial submarginal streak, from the middle of which proceeds internally a very fine elbowed band, which is abruptly much enlarged at its posterior end. In another male the humeral lunule is still finer and shorter, but there is on the disk before the middle at inner fourth, an elongate dash, which represents the posterior end of the long lunule of *lunalonga*, the other markings nearly as in the first male. In the third male there is no trace of pale maculation at any part of the elytra, which is the case also in the single female. Although doubtless allied to *lunalonga*, from Sierra Co., this species seems to differ in the conspicuous ocellated elytral spots, very inconspicuous foveæ and very slender and not "broad" apical lunule.

This is the species that I had previously thought to be *tuolumnæ* Leng, from the Hetch Hetchy Valley, but that is described as sericeous green and with the elytra not visibly punctate. It is my opinion that we have in the Sierras these three species, which are mutually distinct and valid, but if the final verdict be otherwise, *tuolumnæ* and *tularensis* will form well marked subspecies of *lunalonga*, which should in any event be regarded as valid with reference to *pusilla*.

The two following species may be placed near *denverensis* in the *purpurea* group:

Cicindela pugetana n. sp.—Form rather narrow and convex, small in size, alutaceous, bright green throughout above and beneath, the elytral margins brighter green, smoother, less punctate and with a feeble violaceous reflection by oblique illumination; head (♂) densely pubescent on the front medially; labrum pale, with fine black anterior edge, the median lobe advanced and sharply tridentate; prothorax much narrower than the head, slightly transverse, moderately narrowed basally, uniformly green and finely, very densely sculptured; elytra two-thirds longer than wide, not quite twice as wide as the prothorax, closely, granularly punctate, the type without trace of humeral spot but with a very minute pale spot representing the posterior end of a humeral lunule, also with an externally attenuated triangular spot at the apex and with a slender elbowed median band, not attaining the sides; terminal abdominal sinus broadly parabolic; sides of the prosternum with long conspicuous pubescence, the remainder of the under surface glabrous or nearly so; legs slender, the middle tarsi a little longer than the tibiæ. Length (♂) 11.5 mm.; width 4.4 mm. British Columbia,—Knaus. A single example.

Differs from the male of *denverensis* in its much less pubescent head and prothorax, coarser and stronger granuliferous elytral

sculpture, in having the palpi entirely black, the second joint of the labial being very pale straw-yellow in *denverensis*, in the less evident pubescence of the under surface and in having the long white coarse hairs along the external sides of the tibiæ very dense and conspicuous; in *denverensis* there are only very sparse erect white bristles along the tibiæ.

Cicindela parallelonota n. sp.—Body nearly as in the preceding, alutaceous and bright green, with blue reflection by oblique light throughout above, more shining and greenish-blue beneath, the legs metallic green; head (♀) loosely pubescent throughout, the occiput glabrous, the frontal convexity more densely pubescent; labrum as in the preceding but with the median lobe rather less prominent, though even more sharply tridentate; prothorax shorter and broader, transverse, narrower than the head, similarly sculptured and with deep transverse impressions; elytra nearly similar in form and proportion, very gradually smoother, bluer and more shining toward the sides, with not very close-set but sharply granuliferous moderate punctures uniformly distributed throughout, the type with a slender but complete humeral lunule, a broader complete apical lunule, which is broadly dilated and inflexed anteriorly and, at the middle of the length between the median line and lateral sixth, a broad transversely parallelogramic isolated white spot; under surface with long coarse and rather sparse white hairs laterally; tibiæ with sparse erect white hairs; palpi black throughout. Length (♀) 11.8 mm.; width 4.7 mm. Nevada (Las Vegas),—Spalding.

The three species *denverensis*, *pugetana* and *parallelonota*, form a very well defined group of the genus, not very closely allied to any other but includable within the limits of the *purpurea* group; they are all distinctly isolated and are apparently true species. *Sierra* Leng also seems to be assignable to this *denverensis* group.

I have recently received a specimen of *albertina* taken by Prof. L. Bruner at Worland, Wyoming. It does not differ from the Alberta types. It is quite distinct in appearance from *decemnotata*.

The three following forms belong to the *tranquebarica* group. I will describe them as species, for they are all distinctly different from any heretofore published, but will designate their closest allies.

Cicindela wichitana n. sp.—Body rather small in size and of stout abbreviated, moderately convex form, dull in lustre and dark coppery-brown to obscure green throughout above, the elytra a little brighter greenish or coppery laterally and the bottoms of the pronotal sulci finely blue; under surface bluish-green, the prosternal side-pieces coppery; head and eyes moderately developed, sparsely pubescent, densely on the frontal umbo; labrum rather short, the median lobe acutely tridentate;

prothorax barely (♂) to distinctly (♀) narrower than the head, a third to two-fifths wider than long, finely, densely sculptured; elytra marked throughout nearly as in *tranquebarica*, with the punctures rather small and not close-set, though more distinct than in that species, more abbreviated in form and with the fine prolongation of the humeral lunule less oblique; legs and tarsi more slender; tip of the abdomen (♀) differing in being canalicularly impressed apically. Length (♂ ♀) 11.8–12.0 mm.; width 4.9–5.2 mm. Kansas,—Knaus. Four specimens.

This may prove to be more properly a subspecies of *tranquebarica*, but it differs in its very much smaller size and in other ways as detailed above.

Cicindela lassenica n. sp.—General form and ornamentation nearly as in *tranquebarica* but differing remarkably in coloration, deep black throughout above, beneath and on the legs, without trace of metallic coloration at any point, very dull in lustre above, rather shining beneath; head (♂) moderate, with long sparse hairs, which are dense on the frontal umbo; labrum rather short, tridentate medially; prothorax large, transversely quadrate, fully one-half wider than long and as wide as the head, densely sculptured; elytra oblong, parallel, with less arcuate sides than in *tranquebarica* but with identical maculation, the middle band similar, the posterior arm short and not long as it is in *vibex* and *kirbyi*; punctures fine, feeble, close-set and strongly granuliferous, the ground very opaque; under surface moderately hairy toward the sides, coarsely on the propleura; legs moderate. Length (♂) 13.5 mm.; width 5.3 mm. California (without further indication of locality).

Though similar to *tranquebarica* in its markings, I hardly think that the taxonomic value of this form can be less than specific.

Cicindela moapana n. sp.—Habitus similar to that of *vibex* and *kirbyi* but larger and with more elongate and larger elytra, dark coppery-brown, the head and pronotum a little brighter, cupreous, the bottom of the deep sulci blue; sides of the elytra smoother, more shining and rather bright coppery-red; under surface more shining, blue-green, the side-pieces of all the sterna bright coppery; legs cupreous-red; head (♀) well developed, with sparse white hairs, which are dense on the frontal umbo; labrum short, pale, with black anterior edge, acutely tridentate; prothorax equal in width to the head, transverse, slightly narrowed from apex to base, sculptured densely as usual; elytra large, more than one-half longer than wide, subparallel, with feebly arcuate sides and with almost circularly rounded apex in posterior third, the humeral lunule as in *vibex*, the apical as in *kirbyi* but much broader, the median band unlike anything else in the group, consisting solely of the posterior arm as seen in *kirbyi*, the portion from the angle to the sides wholly obsolete and without the faintest suggestion caused by irregularity of sculpture, the latter being perfectly even over the place which is occupied by the transverse part of the band in the allied species; legs rather long, the hind tarsi short, not as long as the tibiæ. Length (♀) 15.0 mm.; width 6.2 mm. Nevada (McGill, White Pine Co., 6500 feet).

Either this and the preceding should be regarded as distinct species or all the forms in the true *tranquebarica* subgroup should be placed as subspecies and varieties of the latter; I hold strongly to the first view.

In the *repanda* group the following is a rather well marked relative of *ancocisconensis:*

Cicindela ancocisconensis ssp. **dowiana** nov.—Similar to *ancocisconensis* in general facies but a little larger and more elongate, rather smoother and of a paler brown color; prothorax not quite so transverse but similarly nearly as wide as the head; elytra larger and longer, the fine punctures much less close-set, the rather fine pale maculation similar, except that the humeral lunule is notably longer; tarsi similarly rather short. Length (♀) 14.0 mm.; width 5.3 mm. New York (De Bruce),—R. P. Dow.

This form can be distinguished at once from typical *ancocisconensis* on direct comparison; my series of the latter is very homogeneous and is from North Carolina (Asheville) and Buffalo, N. Y.

Having now at hand a topotype of *apicalis* of the *togata* group, from Kackley, Ks., perfectly matched by another from Lincoln, Neb., I am able to compare the three described forms more intelligibly. *Togata* and *apicalis* have the same slender outline, but in the former the apical elytral spine of the female is very far retracted, projecting from the sutural margin far from the tip; in *apicalis* this spine is nearly but not quite at the apex and it differs furthermore from *togata*, in having the short projection at the position of the median band more acutely angulate, its anterior slope more rectilinearly oblique and the reëntrant angle behind the humeral part more acute. In *globicollis* the body is shorter, the elytra relatively more inflated posteriorly and the elytral markings almost exactly as in *togata*, but the elytral spine is nearly at the apex as in *apicalis;* the prothorax differs from either in being more inflated at the median part of the sides. It is probable that both *apicalis* and *globicollis* should be considered subspecies of *togata*, in spite of the markedly different position of the apical spine of the elytra in *togata*.

The following is a distinct species of the *togata* group:

Cicindela fascinans n. sp.—Nearly similar in outline to *globicollis*, rather bright coppery-brown, the head throughout with short decumbent stout white hairs, notably close-set and even, the prothorax with slightly longer and less close-set hairs of the same kind, the under surface green

and cupreous, with very dense white hairs, glabrous only along the middle, more broadly on the sterna; eyes large and prominent; labrum (♂) short, with a single small acute medial tooth; prothorax much narrower than the head, nearly as long as wide, convex, parallel, with strongly and evenly rounded sides; elytra subparallel, acutely ogival at tip, white throughout, except a cupreous sutural region broad at base, narrowly ending at two-thirds, its lateral outlines bilobate; white area minutely and sparsely, the cupreous strongly and closely, punctate; serrulation of the apices very fine, the sutural spine strong and acute; legs very slender, cupreous and green. Length (♂) 9.8 mm.; width 3.4 mm. New Mexico (Santa Rosa),—Knaus.

This is a very interesting form, much smaller in size than *togata* and of very different ornamentation.

In the *marginata* group, *amnicola* should be given specific rank and *mundula* attached thereto as a subspecies or variety.

Cumatilis and *collusor* are merely subspecies of *rufiventris*, but *hentzi* is a different species, allied to *16-punctata* and *sonorana* but distinct from either. *Beckeri* W. Horn, is allied to *sonorana* but is smaller, more slender and much more brilliantly cupreous on the head and prothorax; I have in my collection a good series of five examples taken by Townsend in Chihuahua.